

his wife.

AETIOLOGY

infertility

Pre-testicular Causes	Hormonal disorders	Hypothalamus, pituitary, thyroid & suprarenal
	Systemic disorders	Hepatic, renal, malignancy, etc
Testicular Causes	Congenital	Klinefelter syndrome Sertoli cell only syndrome Cryptorchidism
	Traumatic	Excess heat exposure Irradiation gonadotoxins
	Inflammatory	Mumps orchitis
	Neoplastic	Testicular tumors
	Vascular	Varicocele Testicular torsion
Post-testicular Causes	another classification 1.functional 2.obstructive mechanical	

Normal semen Parameters

1. Physical characters

- **Color:** grayish-white
- **Volume:** 2-5ml
- **PH:** Alkaline
- **Liquefaction time:** normally semen forms a coagulum at ejaculation and liquefies in less than 30 minutes

2. Microscopic examination:

- **Sperm count:** more than 20 millions/ml and less than 250 millions/ml
- **Sperm motility:** 50% or more of the spermatozoa show active forward progression after 2 hours of ejaculation
- **Sperm morphology:** abnormal forms is less than 35%

3. Biochemical markers (not routine): Determination of some semen markers may be of help in some clinical conditions e.g.

- **Fructose estimation** (seminal vesicle marker) may be requested if bilateral congenital absence of the vas deferens is suspected.
- **L-Carnitine estimation** (epididymal marker) may help differentiating pre from post-epididymal obstruction

2. Abnormal Microscopic Parameters:

- a. Azoospermia: absence of sperm in semen
- b. Oligozoospermia: sperm count less than 20 million /ml
- c. Polyzoospermia: sperm count more than 250 million / ml (usually associated with poor sperm motility)
- d. Asthenozoospermia: sperm motility less than 50% after 2 hours
- e. Teratozoospermia: abnormal sperms more than 35%

Advanced semen analysis

- Computer aided semen analysis (CASA)

Advantages objective - new parameters (velocity)

- Staining for pus cells (leukocytospermia) Culture for pathogenic bacteria
- Supravital staining for vitality
- Electron Microscopy
- Sperm Function Tests
 - Hypo osmotic swelling test (HOS)
 - Acrosome reaction
 - Zona free hamster ova penetration assay
 - Chromatin decondensation

Causes of Aspermia (absence of seminal fluid at orgasm)

- 1) **Retrograde ejaculation**: Instead of going out of the urethral orifice, semen passes backwards to the bladder due to a **bladder neck disorder** that may occur after prostatectomy or advanced diabetic neuropathy.
- 2) **Secretory aspermia**: lack of seminal fluid formation may be due to **hypogonadism** or **post-inflammatory fibrosis** of the prostate and seminal vesicles.
- 3) **Non-emission and anejaculation**: failure of the contraction of the prostate, seminal vesicles and vas at orgasm may occur due to **sympathetic denervation** after radical pelvic surgery.

Causes of Hemospermia (blood in semen)

- Bilharzial **seminal vesiculitis**
- Prostatic **Calculi** and **cancer** prostate
- **Blood diseases** and **coagulation defects**
- **Hypertension**

TREATMENT OF MALE INFERTILITY

PROPHYLAXIS

- Early surgery for undescended testis (before the age of 2 years).
- Early correction of testicular torsion (before 4 hours).
- Early management of urogenital infections.
- Avoidance of gonadotoxins e.g. irradiation, and gonadotoxic drugs.
- Cryopreservation of semen before cancer chemotherapy and radiotherapy.

THERAPEUTIC STRATEGIES

Medical treatment

Specific Treatment (for specific disorders) e.g.	Non-specific Treatment (for idiopathic causes) e.g.
Bromocriptine (for hyperprolactinemia)	▪ Androgen therapy
Corticosteroids (for immune infertility)	▪ Anti-estrogen therapy
Antibiotics (for infection)	▪ Human chorionic gonadotropin
	▪ Human menopausal gonadotropin

Steps of AIH:

- 1) Induction and monitoring of ovulation
- 2) Semen processing e.g. by the "swim-up technique"
- 3) Methods of Insemination:
 - d) **Intracervical** insemination: for mechanical infertility and cases with low semen volume
 - e) **Intrauterine** insemination: In cervical hostility and immunological infertility.
 - f) **Intra vaginal** insemination (in cases of deposition failure)

2) **In-vitro fertilization & embryo transfer (IVF-ET)**

Mature oocytes are incubated into culture medium with processed sperms and after spontaneous fertilization embryos are transferred into the uterus. This method was mainly performed for cases with tubal obstruction with normal semen or mild semen parameter disorder.

NB: Gamete Intrafallopian Transfer (GIFT) and zygote Intrafallopian Transfer (ZIFT) are now considered as obsolete techniques.

sperms needed to fertilize oocyte up to single sperm. These techniques include:

- Partial zona **dissection** (PZD) and **Drilling** (ZD): ~~old~~ methods involving interruption of zona pellucida to facilitate sperm entry.
- **Subzonal insemination (SUZI)**: ~~old~~ method entailing placement of few sperms in the perivitelline space.
- **Intracytoplasmic Sperm Injection (ICSI)**: This is **most popular** method in ART. As it requires only one viable sperm to inseminate one oocyte, it can be used in the severe semen parameter disorders up to azoospermia where sperms may be retrieved from the testis or epididymis.